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Wisconsin Department of Commerce

Evaluation # 200507-I

**Safety & Buildings Division**
**201 West Washington Avenue**
**P.O. Box 2658**
**Madison, WI 53701-2658**

# Wisconsin
# Building Products Evaluation

Material: Xillix Insulating Concrete Forms

Manufacturer:
Tritex ICF Products, Inc.
9931 S. 136th Street, Suite 150
Omaha, NE 68138-3936

**Additional Manufacturers:**

SCA
109 Lynch Street
Pardeeville, WI 53954

SCA
1100 Garden of the Gods Road
Colorado Springs, CO 80907

SCA
1830 Rockdale Industrial Road
Conyers, GA 30012

## SCOPE OF EVALUATION

**GENERAL:** This report evaluates the use of the Xillix insulating concrete form wall system, manufactured by Tritex™ wall system, evaluated as permanent form work and insulation system for reinforced lintels, exterior and interior bearing and non-bearing walls, and foundation and retaining walls. The Tritex™ insulating concrete form wall system was evaluated for safety requirements of the foam plastic and structural requirements for the codes listed below.

The **Comm** code requirements below in accordance with the current **Wisconsin Uniform Dwelling Code for 1 & 2 family dwellings:**

- **Foam Plastic:** The Xillix insulating concrete form wall system was evaluated in accordance with the fire safety requirements of **s. Comm 21.11**.
- **Structural:** The Xillix insulating concrete form wall system was evaluated in accordance with the structural requirements of **ss. Comm 21.02,** and **21.02(3)(c)**.

The **IBC** requirements below in accordance with the **Wisconsin Amended ICC Code:**

- **Foam Plastic:** The Xillix insulating concrete form wall system was evaluated in accordance with the fire safety requirements **ss. IBC 2603.1**, **2603.2**, and **2603.3**.
- **Structural:** The Xillix insulating concrete form wall system was evaluated in accordance with the requirements of **IBC Chapter 16**.

## DESCRIPTION AND USE

**General**: Tritex™ Xillix wall system consists of expanded polystyrene (EPS) Xillix's flat wall form, Xillix, is 16" high, 48" long, 9.25" wide (5.5" flat core), 11.25" (7.5" flat core). The forms are held together with the Xillix polypropylene tie, 1-1/4" wide and 6" on center, recessed 5/8". The insulating concrete forms are a stay-in-place insulating system for use in above and below grade construction of commercial and multi-family structures.

The forms are used as permanent form work for structural concrete in load bearing and non-load bearing residential and commercial, below- and above-grade walls. The forms are used in construction of plain and reinforced concrete beams, lintels, exterior and interior walls, foundation and retaining walls. The forms remain in place after setting of concrete and shall be protected by an approved interior and exterior finish material.

The polypropylene section ties are considered an essential part of the assembly. The ties encapsulated in the concrete hold the EPS sides together at the same time of concrete pouring.

For unit block configurations and construction details, see the Tritex™ ICF Products Step By Step Installation Manual.

**Materials** consist of:

- **Polystyrene:** Nominal 1.5 pcf density.
- **Connector Element Webs:** Injection molded polypropylene Xillix web connectors are cast into the EPS walls and used to attach interior and exterior finish materials. Webs are spaced 6 inches on center.
- **Concrete:** Standard applications use minimum 3000 psi at 28 days. Concrete of higher strength may also be used. The concrete can be poured from a truck, by hand, bucket or concrete pump. The concrete shall comply with **s. Comm 21.02(3)(b)** and **s. IBC 1903.1**.
- **Reinforcement:** All steel reinforcement shall be in accordance with **s. IBC 1903.5**.

## TESTS AND RESULTS

Omega Point Laboratories, Inc., conducted testing on the Tritex™ (Xillix forms). Testing in accordance with ASTM E84 for flame spread index (25 or less), and smoke developed index (450 or less).

## LIMITATIONS OF APPROVAL

**General:** Tritex™ (Xillix forms) insulating concrete form is manufactured using 100% modified expanded polystyrene from one of the following manufacturers as listed on page one.

The **Comm** limitations below are in accordance with the current **Wisconsin Uniform Dwelling Code, for 1 & 2 family dwellings:**

- **Foam Plastic:** Tritex™ (Xillix forms) insulating concrete forms system is approved for use with a thermal barrier to separate the blocks from interior spaces in accordance with **s. Comm 21.11(1)**. Where a 1-inch thickness of masonry does not separate the polystyrene blocks from the building interior, including at the top of the wall, a thermal barrier, which has a finish rating of at least 15 minutes, shall be provided.

1. Tritex™ (Xillix forms) insulating concrete forms are approved for use in combustible non-rated construction in accordance with **s. Comm 21.11**. In one- or two-family dwellings, thermal barriers shall be provided to separate the forms from the occupied space of the dwellings per **s. Comm 21.11**.
2. The exterior face of the blocks shall be finished with an approved weather covering and must be protected from ultraviolet light.

- **Structural:** Tritex™ (Xillix forms) insulating concrete forms are approved as structural building elements.

1. The units are approved for use as concrete forms for basement walls and exterior walls when the resulting concrete core thickness satisfies **Table 21.18-A** for one- or two-family dwellings, or when structural calculations for the product are submitted for review.
2. Walls shall be anchored to all floors and roofs. Walls shall be interconnected at corners by embedding and lapping the reinforcement.
3. Structures are **limited** to two stories in height plus a basement.
4. The forms are approved for use to form basement stem walls, and exterior walls when structural calculations are submitted to the department by a Wisconsin registered professional engineer or architect.
5. Below grade walls shall be damp-proofed when required by the local building department.
6. Damp-proofing and water-proofing materials shall be approved by Tritex™ and the local building official, and shall be free of solvents that will adversely affect the EPS foam.

**NOTE:** Tritex™ (Xillix forms), insulating concrete form wall system was **not** evaluated for compliance with the thermal requirements of **Subchapter VI, ss. Comm 22.20**, **22.21**, **22.23**, **22.25**, **22.27**, **22.28**, and **22.31** of the current **Wisconsin Uniform Dwelling Code for 1 & 2 family dwellings**.

The **IBC** limitations below are in accordance with the current **Wisconsin Amended ICC Code:**

- **Foam Plastic:** Tritex™ (Xillix forms) insulating concrete form system is approved for use with a thermal barrier to separate the blocks from interior spaces in accordance with **s. IBC 2603.4.**

1. In accordance with **s. IBC 2603.4.1.6**, when Tritex™ (Xillix forms) insulating concrete forms are used within the attic or crawl space where entry is made only for service utilities, the foam plastic insulation shall be protected against ignition by 1-1/2" thick mineral fiber insulation, a ¼" thick wood structural panel, particleboard or hardboard, gypsum wallboard, corrosion-resistant steel or other approved material installed so that the foam plastic is not exposed.
2. The protective covering shall be consistent with the requirements for the type of construction.
3. The crawl space shall not be used for storage or air handling purposes, there are no interconnected basement areas and entry to the crawl space is only for service of utilities.

- **Structural:** Design of concrete formed by Tritex™ (Xillix forms) insulating concrete forms must comply with **IBC Chapter 19** with the following requirements:

1. The forms are approved for use as concrete forms for basement walls, exterior walls and retaining walls when structural calculations are submitted to the department by a Wisconsin registered professional engineer or architect.
2. Design calculations of walls must comply with **s. IBC 1901.2.** Use of the empirical design approach specified in **s. 2109.1 [Comm 62.2109(1)]** is prohibited.
3. Design of lintels shall comply with the applicable provisions of **IBC Chapter 16.**
4. Wall loading shall be in accordance with **IBC Chapter 16**.
5. Minimum wall reinforcement shall conform to **s. IBC 1901.2**. When the code requires that vertical and horizontal reinforcement be spaced no further apart than 18 inches or three times the wall thickness, whichever is less, the maximum concrete wall thickness along the length of the wall is permitted to be used to determine rebar spacing.
6. Walls shall be anchored to floors and roofs in accordance with **s. IBC 1604.8.2**. Walls shall be interconnected at corners by embedding and lapping reinforcement in accordance with the code.
7. Design of shear walls shall be in accordance with **ss. IBC 1901.2** and **1910**.
8. Structures are **limited** to two stories in height plus a basement.
9. Below grade walls shall be damp-proofed when required by the local building department, waterproofed in accordance with **s. IBC 1806**.
10. Damp proofing and waterproofing materials shall be approved by Tritex™ (Xillix forms), and the local building official, and shall be free of solvents that will adversely affect the EPS foam.
11. Special inspection is required as noted in **s. IBC 1704**, for placement of reinforcing steel and concrete, and for concrete cylinder testing, except that special inspection is not required for foundation stem walls conforming to **Table 1805.4.2** of the **IBC**. Additionally, when the building official approves, special inspection is not required when all of the following conditions are met:

    a) Wall systems are a maximum of 8 feet high and are limited to use in single-story construction of Group R-3, or Group U Occupancies.
    b) Maximum height of a concrete pour is 48 inches. Succeeding lifts must be placed in accordance with **s. IBC 1905.10.**

c) Installation is by properly trained installers approved by Tritex™ (Xillix forms).
d) The installation instructions indicate methods used to verify proper placement of concrete.

12. Walls constructed with Tritex™ (Xillix forms) insulating concrete forms blocks, is considered Type V Construction.

**NOTES:** 1) The Tritex™ (Xillix forms) insulating concrete forms wall system was **not** evaluated for compliance with the thermal requirements of **s. Comm 63.1018**.
2) **Note: Structural calculations shall be submitted (job-to-job basis) in accordance with IBC Chapter 16 for Live, Ground Snow, Roof, Wind, and Seismic Loads.**

**Alternate Design:** In lieu of calculations, the structural design of reinforced concrete formed Tritex™ (Xillix forms) insulating concrete forms wall system for residential construction is permitted to comply with the *Prescriptive Method for Insulating Concrete Forms in Residential Construction* (publication No. EB118) published by the Portland Cement Association (PCA). Buildings constructed with the Tritex™ (Xillix forms) insulated concrete forms wall system and designed in accordance with the alternate design, will not exceed a height of two stories plus a basement, where the maximum unsupported wall height is 10 feet.

Tritex™ (Xillix forms) insulating concrete forms shall be installed in accordance with the manufacturer's installation instructions/manual.

**Identification**: Each package bears a label specifying the name and address of the manufacturer (Tritex™ ICF Products, Inc., Omaha, NE). Additionally, product labels indicate the Wisconsin Building Product Evaluation Number (**200507-I**), and the name and logo of the quality control agency (Omega Point Laboratories).

This approval will be valid through December 31, 2010, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

**DISCLAIMER**

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date:
Approval Date: June 13, 2005 By: _____

Lee E. Finley, Jr.
Product & Material Review
Integrated Services Bureau

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